

## Resistogram pattern of *Escherichia coli* isolated from various clinical samples in & around Kanchipuram

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### Abstract

*E. coli* is one of the main cause of nosocomial infection in humans. *E. coli* being one of the common organism causing hospital acquired infections exhibits ESBL production. Causing resistant to Beta lactam group of drugs resulting in limited treatment options. Hence, this study was done to know the resistance pattern in *E. coli* and their virulence factors. **Materials and Methods:** Samples (urine, pus, sputum) were collected & processed as per standard protocols *E. coli* were isolated. Antibiogram done as per CLSI guidelines. ESBL & MBL screening done, Biofilm formation of *E. coli* was studied in correlation to antibiotic resistance. **Result:** 235 *E. coli* were isolated from various clinical samples. Out of 235, 148 (62.97%) showed resistance to ceftazidime & cefotaxime, 53 (22.55%) were ESBL producers, 19 (8.8%) showed resistance to imipenem, 32 (1.27%) were MBL producer. *E. coli* were resistant to nalidixic acid, 119 (50.6%) followed by Cotrimoxazole 98(41.7%), Ciprofloxacin resistance was 135 (57.6%) and MIC ranged from 8- 64 µg/ml. Among 235 *E. coli* isolates 169 (46.38%) were MDR of which 29 (12.34%) were strong biofilm producers. **Conclusion:** This study highlights that all isolated ESBL producers were resistant to 3rd Gen. cephalosporins. This increase in resistance to number of commonly used antibiotics shows the emerging drug resistance. In view of this, ESBL testing and MBL screening should be made as a routine testing which will help in the shuffling of antibiotics and for proper treatment and to prevent further development of bacterial drug resistance. *Escherichia coli* is one of the important cause of nosocomial infections in humans [1]. *E. coli* is widely implicated in various clinical infections as hospital acquired and community acquired [2]. Pathogenic isolates of *E. coli* have relatively high potentials for developing resistance. Resistance to gram negative bacteria have great concern as these organisms are becoming resistant to Penicillin, cephalosporin & monobactams [3]. Increasing bacterial resistance is now highly prevalent in developing countries and is currently worrisome problem. Antimicrobial resistance is a growing threat worldwide with different resistant mechanisms [4]. The production of Extended spectrum of beta lactamase is an important mechanism which is responsible for the resistance to 3rd generation cephalosporin [5]. Among the wide array of antibiotics β lactams are widely used agents accounting for over 50% of all systemic antibiotics in use [6]. The most common cause of resistance to β lactam antibiotics is the production of β lactamases. ESBL are plasmid borne and confer multiple drug resistance making the infection severe and difficult to treat [7]. In India ESBL, *E. coli*

ranges from 41 – 60% highest is 86% reported in 2017. Fluroquinolone antibiotics are now continued to increase, which is of great concern, which accounts 20% of HAI [8]. β lactam resistance, fluoroquinolone resistance with bacterial biofilm is considered as a pathogenic treat for Nosocomial infections. *E. coli* is a common human pathogen being MDR, including resistance to quinolones [9]. There is always a gap in the knowledge based and this makes the patient care largely empirical. This makes physicians to prescribe multiple antibiotics which is both cost and morbidity wise increase. In order to curb the problem, some primary data on the resistance pattern is to be known for selecting appropriate drugs. Bacterial biofilm has been considered as a virulence factor contributing to infections associated with various medical devices, causing nosocomial infection [10]. The tendency of microorganism to develop biofilm has been well documented for number of medical devices. This process is particularly relevant because biofilm associated microorganisms are much more resistant to antimicrobial agents. *E. coli* being one of the commonest organism causing hospital acquired infections exhibits ESBL production which renders organism resistant to β lactam group of drugs leading to limited treatment options. In our hospital, *E. coli* is one of the common organism encountered every day in routine culture reporting. Hence this study done to know the prevalence of ESBL *E. coli*, their resistance pattern and their virulence factors.

**Background:** Antimicrobial resistance is an emerging threat in today's world. Most of the common pathogens are demonstrating significant resistance to commonly used drugs. *Escherichia coli* (*E. coli*) is one of the most common bacterial pathogens in India. There are recent reports of high level of antibiotic resistance in *E. coli*. This will affect the treatment of common conditions such as urinary infection. This is a public health crisis for low- and middle- income countries such as India, as higher antibiotics will cause strain on the already restricted health budget. However, to curb the problem, there is need of clinical data on the prevalence of resistance.

**Objective:** This cross-sectional study was aimed at generating primary data on the prevalence of antibiotic resistance in *E. coli* in a sample population from Eastern India. **Materials and Methods:** This study was carried out in a tertiary care hospital of Eastern India. Adult patients presenting with urinary tract infection (UTI) were included. Clean catch midstream urine sample was collected and cultured under aerobic conditions. Antibiotic sensitivity was tested by disk diffusion

method after liquid culture. Standard descriptive statistical methods were used. Microsoft Excel was used for arranging the data.

**Result:** There were 32 patients in the study with male:female ratio of 10:22. Almost half (47%) of the specimens were resistant to ceftriaxone. Aminoglycoside resistance was found in 25% of the organisms. Fluoroquinolones resistance was also very high with 60% resistant to norfloxacin. E. coli specimens of 78% (n = 25) were multidrug resistant.

**Conclusion:** Our results give some preliminary data on antibiotic resistance pattern of E. coli in this region. This will help in the choice of antibiotics for common conditions such as UTI. However, bigger multicentric studies are needed.

### Biography

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